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ABSTRACT

Case-based instruction (CBI) is used in a variety of professional schools. Studies indicate that CBI can have promising results, but they do not provide insights into the theoretical justification for using CBI. An earlier paper (Risko and Kinzer, 1994) identified five theoretical constructs for CBI: anchored instruction; reflective thinking; situated cognition; generative learning; and the ability that CBI has to prepare teachers to deal with the ill-structured nature of teaching. This research project studied the nature of these theories in a 16-week literacy course for preservice elementary education majors that used CBI in order to extend the theories themselves and reconsider their viability for CBI. Data included information about classroom interactions, the instructor's reflections about class activities, the instructor's reflections about the theories, students' answers to study guides as they analyzed the cases, videotapes of each class session, students' lesson plans and reflections from their concurrent field experiences, and audiotapes and notes from individual interviews with each student at the end of the semester. (Contains 22 references.) (Author/MES)

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Preservice Literacy Teachers, Digital Literacy Portfolios, and Multimedia Case-based Instruction: Examining the Theoretical Basis for Case-based Instruction

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Abstract: Case-based instruction (CBI) is used in a variety of professional schools. Studies indicate that CBI can have promising results but they do not provide insights into the theoretical justification for using CBI. Risko and Kinzer (1994) identify five theoretical constructs for CBI: anchored instruction, reflective thinking, situated cognition, generative learning, and the ability that CBI has to prepare teachers to deal with the ill-structured nature of teaching. We studied the nature of these theories in a 16-week literacy course for preservice Elementary Education majors that used CBI in order to (a) extend the theories themselves and (b) reconsider their viability for CBI.

Case-based instruction (CBI) is used in a variety of professional schools. Schools of Business, Medicine, Law, and Education are finding promising results with CBI (see Christensen, Garvin, & Sweet, 1991; Merseth, 1997; Shulman, 1992). Recent innovations have included the development of video-based and multimedia cases. Fitzgerald and Semrau (see Fitzgerald, Semrau, & Deasy, 1997) are developing multimedia cases which provide embedded prompts within a hypermedia interface. Hughes, Packard, and Pearson (1999) developed video-based cases and found that the more time literacy teachers spent examining video cases, the better they were able to support their claims about teaching reading. Risko, Yount, & McAllister (1992) found that literacy teachers who examined multimedia cases during class asked more questions and more higher level questions than students in similar courses that did not use the cases. They also found that the students enrolled in CBI courses developed the ability to take multiple perspectives on various teaching issues and problems much earlier than their peers enrolled in similar non-CBI courses. In another study, Risko, Peter, & McAllister (1996) found that CBI had an impact on the students' ability to think flexibly in related field experiences and discussions in other courses.

While these studies are informative by focusing on the effectiveness of video-based and multimedia CBI, they do not provide insights into the theoretical justification for using CBI. Risko and Kinzer (1994) identify five theoretical constructs for CBI: anchored instruction, reflective thinking, situated cognition, generative learning, and the ability that CBI has to prepare teachers to deal with the ill-structured nature of teaching (see also Christensen, 1987; Merseth, 1997; Shulman, 1992). However, these theories typically emerged in non-CBI settings. We studied the nature of these theories in a 16-week literacy course for preservice Elementary Education majors that used multimedia CBI in order to (a) extend the theories themselves and (b) reconsider their viability for CBI. While many aspects to the nature of each theory emerged, in this paper we limit our discussion to aspects that challenge current conceptions of these theories.

Theoretical Framework

Theories of *anchored instruction* (Cognition and Technology Group at Vanderbilt, 1990) hypothesize that students need to have a shared context (anchor) to effectively discuss theirdivergent perspectives. Theories of *reflective practice* (Schon, 1983; Zeichner & Tabachnik, 1984) argue that effective teachers evaluate their actions and outcomes. Theories of *situated cognition* (Brown, Collins, & Duguid, 1989) argue that learning is contextualized--thus learning and instruction should represent the context in which the learning is to be applied. Theories of *generative knowledge* argue that learners do not commonly make connections between knowledge that is dispensed to them (i.e., via lectures) and situations where that knowledge can be used. (Bransford, Franks, Vye,

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& Sherwood, 1989; Bereiter, & Scardamalia, 1985; Whitehead, 1929). Instead, learners make better connections when they generate knowledge (Risko, McAllister, Peter, & Bigenho, 1994). Last, case-based instruction is based on theories which argue that teaching is an *ill-structured* task (Clark, 1988; Greeno, & Leinhardt, 1986) and therefore learning and instruction should prepare teachers to make decisions based on constantly changing sources of information.

Methodology

Setting and Participants

This study occurred in a midwestern state university in a section of a course entitled, "Emergent Literacy for Elementary Teachers." The students were first semester Juniors who had taken 8 semester hours of introductory education courses during their Freshman and Sophomore years. They had also done over 20 hours of classroom observations during their Freshman and Sophomore years. This was however, their first semester of taking methods courses. There were 34 students in the class, 31 females and 3 males. All the students were Elementary Education majors.

The course was part of a block of literacy courses which included 2 semester hours of Children's Literature, 2 semester hours of Emergent Language, and 3 semester hours of Emergent Literacy for Elementary Teachers. These preservice teachers also participated in 2 semester hours of field experience in which they worked with a partner to teach 8-10 literacy lessons to a small group of elementary children. They collaborated with the elementary children's teacher to design, implement, and reflect on their lessons and the progress of the children's literacy abilities. The participants took this block of literacy courses as a cohort. In other words, the same group of preservice teachers attended Children's Literature, Emergent Language, Emergent Literacy and Literacy Field Experience (9 hours per week) together.

Digital Cases

The case-based instruction was based on elementary children's digital literacy portfolios. The interface (see web.missouri.edu/~fipse/index.html) gives users access to video segments of a child as s/he reads and writes with classmates, the teacher, and the case developers (who functioned as participant-observers in the elementary classrooms). Each video segment includes related artifacts. For example, if the video involves a child reading, then the artifact is the book that is being read. This allows the user to see what the child saw while s/he was reading. If the video involves a child writing, then the artifact is the writing sample that s/he wrote. This allows the user to see what the child wrote. Each video also includes a scenario which explains what happened before and after the video. The scenario includes the text from the book in the video so the user can mark what the child says when s/he tries to read the text. The video segments (with corresponding artifacts and scenarios) can be sorted by month and by content area (e.g., Literature, Social Studies, Science, and Math) so the users can either examine the child's literacy abilities across time or across content areas. The interface also allows users to mark video segments so they can randomly access these segments during case analysis and class discussions.

Data Collection

Due to the nature of our research questions, we collected several data sets which included information about classroom interactions, the instructor's reflections about class activities, the instructor's reflections about the aforementioned theories, students' answers to study guides as they analyzed the cases, videotapes of each class session, students' lesson plans and reflections from their concurrent field experiences, and audio tapes and notes from individual interviews with each student at the end of the semester.

Data Analysis

We used qualitative data analysis techniques to understand the nature of anchored instruction, reflective thinking, situated cognition, generative learning, and preservice teachers' ability to deal with the ill-structured nature of teaching. Specifically, we analyzed the instructor's reflections about the theories. We identified comments which extended current conceptions of these theories. We then analyzed data sets to confirm and disconfirm the

instructor's perceptions. For example, in order to confirm and disconfirm the instructor's reflections about theories of anchored instruction we reviewed videotapes of class discussions, students' answers to the study guide questions, and answers during individual interviews. The videotapes allowed us to examine the role of the anchor in class discussions. The study guides allowed us to examine the relationship between the anchor and the students' divergent field experiences. The interviews provided, among other things, information about the students' perceptions of how the cases helped them understand one another's field experiences. Similar procedures were followed to examine theories of reflective thinking, situated cognition, generative learning, and preservice teachers' ability to deal with the ill-structured nature of teaching.

Findings

While using multimedia case-based instruction to prepare elementary literacy teachers, we found the need to revise or extend theories of anchored instruction, reflective thinking, situated cognition, generative learning, and perceptions that CBI can prepare teachers to deal with the ill-structured nature of teaching. For example, theories of anchored instruction claim that learners can use a common experience (an anchor) to help one another understand each other's own background experiences. We found the opposite to be true as well. The preservice literacy teacher used their different field experiences to help each other understand the anchor (the cases). Current perceptions of anchored instruction are unidirectional (anchor–>helps learners understand one another's background experiences). This study indicates that the anchor and the learners' divergent experiences may be reflexively related (anchor <–> divergent experiences).

Theories of reflective practice advocate the value of helping teachers develop reflective metacognition. We found that preservice teachers' reflective practice may not transfer from one domain of thinking to other domains. The preservice literacy teachers grew in their ability to reflect on children's literacy abilities, however, during case discussions they were not reflective about alternatives to planning instruction. While the participants' lack of reflection became a valuable focus for further instruction, this finding raises questions about theories of reflective practice. Specifically, do teachers need to be trained in reflective practice that is specific to each aspect of teaching (e.g., children's literacy abilities, activities which foster children's literacy development who demonstrate certain literacy abilities)? Do teachers transfer their ability to reflect about one aspect of teaching (e.g., children's literacy abilities) to other aspects (e.g., instructional practices which foster children's literacy development who demonstrate certain literacy abilities)? How much practice do preservice teachers need before they transfer habits of reflective metacognition from one domain to another?

Theories of situated cognition argue that learners recognize when and how to use knowledge when they learn the knowledge in situations that are similar to where they will use it. Herein, case-based instruction appears to be a natural pedagogy which allows the instructor to situate the knowledge and thereby undergird students' abilities to access the knowledge when similar situations arise. While we found that the students recognized ways to use the course content in their field experiences, we also found that situated cognition was just as important to the instructor. The instructor had been an elementary teacher for seven years. She found that her knowledge of teaching and literacy was in many ways situated in her elementary teaching experiences. For example, while discussing Julie and Zane during CBI, the instructor raised issues of text "friendliness." In her experience as a teacher she learned that a child's reading ability was often determined by the text itself. If children read poorly it could be because they lacked background knowledge or vocabulary; they may have expected certain syntactical structures. However, if they were given an "friendly" text which supported their background knowledge, used their vocabulary and syntactical structures, then they could read well. At the time of this study, the instructor had taught preservice literacy teachers for eight years. She often thought about the importance of discussing "friendly" text but because the instruction was not based on analyzing children's literacy portfolios the topic was typically overlooked. In other words, the instructor's knowledge was situated within her own professional experiences as an elementary teacher. With CBI, the case reminded her of her teaching situation and she remembered to cover issues such as the importance of noticing if a text is "friendly" to the reader. Herein we found that situated cognition is not for learners only. Situated cognition is also critical for the instructor.

Students generated knowledge and questions throughout all aspects of the CBI experience. They questioned and learned from each other through discussions, written analysis, and field experiences. The findings of this study supports theories of generative knowledge which claims that learners make better connections between knowledge they generate and situations in which they can use the knowledge than when knowledge is dispensed to them (i.e., lecture; Whitehead, 1929). During data collection and analysis, we did not find any challenges to theories of generative knowledge. For example, during classroom discourse analysis, we found that within five class

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sessions, the student initiated portions of the discussion went from 42% to 100%. While this dramatic shift occurred during CBI, the instructor encouraged the students to generate topics throughout the course. In other words, our findings do not indicate that case based instruction *causes* students to generate topics of discussion but rather it can be used to encourage students to generate topics of discussion. From the first case discussion session to the third case discussion session the frequency of student's questions and responses increased. However, during the fourth case discussion the question frequency from the instructor decreased and student to student interactions became the discourse pattern. Here students initialized questions, made observations of specific instances from the case and suggested solutions to the questions. During session four, the teacher did not initialize or redirect the discussion. The students generated the entire discussion.

Theories of the ill-structured nature of teaching examine how teachers need to be prepared to synthesize and orchestrate many sources of information simultaneously while making hundreds of decisions each minute (Clark, 1988; Leinhardt, 1986). Meanwhile, preservice teachers tend to want to know the specific steps necessary to teach a child to read and write. The challenge is to help preservice teachers understand that simply following the steps of a teaching strategy is not all there is to teaching reading or writing. During data collection and analysis, we found that the students gave alternate explanations and analyses of the cases. The individual interviews inquired about the student's perception regarding the ill-structured nature of teaching by asking, "Is there a right and wrong way to teach Zane and Julie? Explain." Student's responses consistently indicated an awareness that there were many ways to provide appropriate instruction.

Stacy: The way they did it was right, but you could also do it differently. And that would have been fine too.

Jill: Everyone has their own way of teaching. You learn by experience and change from there. As long as you see good results there is no right way.

The students recognized that one set of explanations was not necessarily right or wrong, simply different. The students even commented that they never realized there could be so many instructional alternatives. However, after five classes which used CBI, the students asked which epistemological stance was correct for literacy instruction: constructivism or objectivism. In other words, while the students were willing to accept different analyses of children's literacy abilities and different instructional methods to foster the children's literacy abilities, they still wanted to know which epistemology was right and which one was wrong. Their interest in diverse perspectives did not transfer from ideas for Zane's instruction to ideas about epistemologies. Herein, the value of divergent perspectives did not transfer from one area of teaching to another.

Summary and Discussion

While using case-based instruction to prepare elementary literacy teachers, we found the need to revise or extend theories of anchored instruction, reflective thinking, situated cognition, generative learning, and perceptions that CBI can prepare teachers to deal with the ill-structured nature of teaching. Current perceptions of anchored instruction are unidirectional (anchor-->helps learners understand one another's background experiences). This study indicates that the anchor and the learners' divergent experiences may be reflexively related (anchor <--> divergent experiences). Further investigations may want to examine if this reflexive relationship emerges in other settings. If so, researchers could ask such questions as: How similar do the divergent experiences need to be before they are reciprocally related to the anchor. In our study, the divergent experiences included a field experience in which each preservice teacher was analyzing a small group of elementary children's literacy abilities and then designing, implementing, and evaluating lessons to support these children's literacy development. While the preservice teachers worked with different children in different classrooms, it could be that their divergent field experiences were similar enough to foster a reflexive relationship with the anchor (case). If the preservice teachers are not involved in similar but divergent experiences, are their experiences and the anchor still related? Answers to these questions may help teacher educators understand the role and value of integrating field experience discussions with CBI. Such answers may also help instructors in other professional schools (e.g., business and medical) to determine the value of providing "field experiences" that correspond to their CBI courses.

Theories of reflective practice advocate the value of helping teachers develop reflective metacognition. We found that preservice teachers' reflective practice may not transfer from one domain of thinking to other domains. While the participants' inabilities became a valuable focus for further instruction, they raise questions about theories of reflective practice. Specifically, do teachers need to be trained in reflective practice that is specific to each aspect of teaching (e.g., children's literacy abilities, activities which foster children's literacy development who demonstrate certain literacy abilities)? Do teachers transfer their ability to reflect about one aspect of teaching (e.g.,

children's literacy abilities) to other aspects (e.g., instructional practices which foster children's literacy development who demonstrate certain literacy abilities)? How much practice do preservice teachers need before they transfer habits of reflective metacognition from one domain to another? Further studies need to be done in this area.

While theories of situated cognition have been under recent scrutiny (see Anderson, Reder, & Simon, 1996, 1997; Cobb & Bowers, 1999; Greeno, 1997), the discussion continues to focus on the learner. We found that theories of situated cognition can also apply to the instructor. In this study, because the instructor had been an elementary teacher, she remembered viable topics for discussion during class analyses of the cases. However, we were unable to triangulate this finding because only one instructor was involved. In order to confirm or disconfirm this finding, future studies need to be conducted in other CBI settings where the instructor has practiced the profession addressed in the cases. If this finding occurs in other settings, then theories of situated cognition may need to reconsider their focus on the learner and explore the impact it has on the instructor. Such a finding would be important for CBI because it could indicate that instructors who have practiced in the profession may provide higher quality instruction (as evidenced by providing situated knowledge to students) when they use CBI than when they do not use CBI.

Theories of generative learning claim that learners make better connections between knowledge they generate and situations in which they can use the knowledge than when knowledge is dispensed to them (Whitehead, 1929). Our findings indicate that preservice teachers did generate questions and information in CBI activities. Our analysis focused on the dialogue and question interaction patterns that were observed during class discussions. While beyond the scope of this paper, research that examines the nature and quality of questions that preservice ask about a case might inform teacher educators about the preservice teachers knowledge construction.

While studies indicate that CBI can help prepare teachers to deal with the ill-structured nature of teaching (Risko, Yount, & McAllister, 1992), we found that they still wanted right and wrong answers to some issues. In other words, we found that the students' value of diverse perspectives and alternate explanations was situated. They did not transfer the value of diverse perspectives and alternate explanations to different aspects of teaching (e.g., students could generate alternate analyses and interpretations of a child's literacy abilities but wanted to know which epistemology was correct, objectivism or constructivism). Herein, our findings challenge current notions that CBI can help students "develop a comprehensive view of teaching issues and problems much earlier than their peers enrolled in classes not using these cases" (Kinzer & Risko, 1998, p. 198). While this notion may be correct, it may also be limited to the context that the cases have addressed.

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